

## Complete Summary

---

### GUIDELINE TITLE

Guidelines for the management of leg ulcers in Ireland.

### BIBLIOGRAPHIC SOURCE(S)

Smith & Nephew Ltd. Grace P, editor(s). Guidelines for the management of leg ulcers in Ireland. Dublin (Ireland): Smith & Nephew Ltd; 2002. 44 p.

## COMPLETE SUMMARY CONTENT

SCOPE  
 METHODOLOGY - including Rating Scheme and Cost Analysis  
 RECOMMENDATIONS  
 EVIDENCE SUPPORTING THE RECOMMENDATIONS  
 BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS  
 CONTRAINDICATIONS  
 IMPLEMENTATION OF THE GUIDELINE  
 INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT  
 CATEGORIES  
 IDENTIFYING INFORMATION AND AVAILABILITY

## SCOPE

### DISEASE/CONDITION(S)

Leg ulcers

### GUIDELINE CATEGORY

Evaluation  
 Management  
 Prevention  
 Treatment

### CLINICAL SPECIALTY

Dermatology  
 Endocrinology  
 Family Practice  
 Geriatrics  
 Internal Medicine  
 Nursing

### INTENDED USERS

Advanced Practice Nurses  
Nurses  
Physician Assistants  
Physicians  
Public Health Departments

## GUIDELINE OBJECTIVE(S)

To provide clinical guidelines to inform practice in the management of leg ulcers in the Irish setting

## TARGET POPULATION

Patients in Ireland with leg ulceration

## INTERVENTIONS AND PRACTICES CONSIDERED

### Assessment

1. Medical history
2. Physical examination
  - Gait assessment/reduced joint movement
3. Ulcer examination (site, size, depth, edge, base, exudates, and surrounding skin)
4. General assessment
  - Blood pressure, weight, urinalysis, baseline haematology and biochemistry
  - Ankle brachial pressure index (ABPI) using Doppler probe

### Management/Treatment/Prevention

#### Venous Leg Ulcers

1. Compression therapy
  - Light, moderate, or high compression with bandaging
2. Healing environment (patient involvement and motivation, nutrition counseling)
3. Good cleansing practices
4. Dressing leg ulcers
5. Pain management
6. Treatment of chronic wounds (debridement, reduction of bacteria, reduction of exudate, systemic antibiotics for infection)
7. Patient education (diet, exercise, elevation, rest)
8. Ulcer recurrence prevention
9. Weekly reassessments

#### Infected Leg Ulcers

1. Further evaluation to identify relevant factors
  - Physical examination for specific disorders (e.g., varicose veins, deep vein thrombosis, phlebitis)

- Wound assessment (exudate, malodour, oedema)
  - Routine blood investigation (full blood count, erythrocyte sedimentation rate (ESR), urea and electrolytes, C reactive protein, liver function tests, lipid profile, and antibody screen)
  - Duplex scan
  - Bacteriological assessment
2. Symptomatic treatment (removal of debris, controlling exudate, maintaining a moist environment, pain relief, and compression therapy)
  3. Wound cleansing
    - Normal saline or water
    - Chemical or surgical debridement
    - Antiseptic agents when blood supply is impaired and in patients with impaired immunity
  4. Treatment with antimicrobials and/or antibiotics
  5. Hospital referral for: suspected malignancy; arterial/mixed ulcers; diabetes mellitus and ulcer; sepsis--cellulitis, fever, leucocytosis; absent pulses with impaired ankle brachial pressure index measurements (ABPI); failure to heal with standard regime; underlying co-morbidity; deterioration; recurrent ulceration; need for surgery --varicose veins surgery, skin graft, biopsy, revascularization; pain management

#### Skin Conditions

1. Treatment of eczema (asteatotic dermatitis, stasis dermatitis [varicose eczema], atopic dermatitis, contact dermatitis)
2. Avoidance of known irritants and allergens
3. Recognition of infection
4. Patient education

#### Hard to Heal Leg Ulcers

##### Assessment

1. Rule of six
  - Ulcer >6 square centimeters
  - Ulcer present for >6 months
  - Unlikely to heal in compression in six months
2. Accurate assessment in a specialized venous ulcer clinic to distinguish a chronic leg ulcer with a significant arterial component

##### Treatment

1. Wound bed management (debridement, antimicrobial agents, slow release iodine products)
2. Sub-fascial endoscopic perforator vein surgery (SEPS)
3. Bio-engineered skin substitutes
4. Endovascular or bypass surgical techniques for mixed arterial venous ulcers

#### MAJOR OUTCOMES CONSIDERED

- Morbidity

- Health care costs
- Early detection
- Healing rates

## METHODOLOGY

### METHODS USED TO COLLECT/SELECT EVIDENCE

Searches of Electronic Databases

### DESCRIPTION OF METHODS USED TO COLLECT/SELECT THE EVIDENCE

Not stated

### NUMBER OF SOURCE DOCUMENTS

Not stated

### METHODS USED TO ASSESS THE QUALITY AND STRENGTH OF THE EVIDENCE

Not stated

### RATING SCHEME FOR THE STRENGTH OF THE EVIDENCE

Not applicable

### METHODS USED TO ANALYZE THE EVIDENCE

Review

### DESCRIPTION OF THE METHODS USED TO ANALYZE THE EVIDENCE

Not stated

### METHODS USED TO FORMULATE THE RECOMMENDATIONS

Not stated

### RATING SCHEME FOR THE STRENGTH OF THE RECOMMENDATIONS

Not applicable

### COST ANALYSIS

Overall Costs

Leg ulcers are a common and, frequently, chronic problem seen in the health care system in Ireland. They occur in approximately 0.12% of the population at any given time and cost about 6.5 million euros per annum to treat.

### Cost-Effectiveness of Compression Therapy

Compression therapy is more cost-effective than non compression therapy because the faster healing rates save nursing time. Studies have shown that compression improves healing rates compared to treatments using no compression.

## METHOD OF GUIDELINE VALIDATION

Peer Review

## DESCRIPTION OF METHOD OF GUIDELINE VALIDATION

Not stated

## RECOMMENDATIONS

### MAJOR RECOMMENDATIONS

#### Recommendations for Practice

- A standardised and integrated hospital and community based leg ulcer service to facilitate early assessment and use of treatments with proven effectiveness
- Staff training to improve leg ulcer management skills in the community
- The use of compression bandaging for venous leg ulcers
- Corrective surgery for venous and arterial disease of the lower limbs
- Renewed emphasis on the hard to heal leg ulcer
- Clinical audit to monitor practice and prevalence rates
- Randomised controlled trials to evaluate primary and secondary preventive measures for venous leg ulcers

#### Assessment of Patients with Leg Ulcers

##### Medical History

A full medical history is essential, and specific questioning to uncover venous and/or arterial disease is required (see Table I: Venous and Arterial History in section 3 of the original guideline document). Though a positive venous or arterial history signifies the presence of disease, it does not mean that the ulcer aetiology is one and the same. The presence of associated diseases such as rheumatoid arthritis, systemic lupus erythematosus (SLE), and diabetes should be noted. Patients should also be questioned regarding medications, as some (e.g., steroids or cytotoxics) will slow wound healing.

Allergies must be accurately documented. Many patients will report allergies to dressings; however on questioning it becomes clear that it was pain/discomfort

that was experienced rather than an allergic reaction. This information allows one to reconsider important dressings in the present clinical setting.

### Cardiac Disease/Hypertension

It is usually possible with careful history taking to distinguish arterial pain from other causes of leg pain, such as arthritis or infection. Patients classically describe a feeling of tightness affecting their calf or buttocks that is brought on by exercise and relieved by a few moments rest. The pain will occur more rapidly if the patient is going uphill or walking at a more rapid rate. Rest pain is usually described as a "burning" pain affecting the toes and feet, which in its early stages occurs when the patient lies down. Patients will usually volunteer that they get relief by dangling their legs over the edge of the bed. As it progresses it is present constantly and patients will often sit out in a chair at night to get some relief.

Intermittent claudication signifies mild/moderate arterial disease while rest pain signifies critical ischaemia. One must remember that patients with lower extremity ulceration are often elderly and immobile, and they may not exercise enough to experience claudication pain in spite of the presence of arterial disease.

Peripheral neuropathy is the commonest cause of ulceration in the diabetic patient; however, this may be complicated by the additional presence of arterial disease. Patients should be questioned in particular about foot deformity and altered sensation.

### Physical Examination

It is important that patients are examined both lying and standing, and particular attention should be paid to their gait. Reduced joint movement, particularly of the ankle, is associated with poorer healing rates. (See "Table 2: Signs of venous and arterial disease" in section 3 of the original guideline document).

### Ulcer Examination

The site, size and appearance of the ulcer are crucially important. Venous ulcers are usually shallow and located on the gaiter area of the leg. Arterial ulcers may have a "punched-out" appearance and occur often on the toes, feet, or heel. Neuropathic ulcers are classically over bony prominences on the foot, such as the metatarsal heads. Often there is a build up of surrounding callus. Vasculitic ulcers are less easy to classify, but one distinguishing feature is severe pain. Malignancy is a rare cause of lower extremity ulceration. An unusual site or appearance such as rolled edges may suggest the possibility of malignancy, and then punch biopsy must be performed.

The condition of the ulcer and surrounding skin should also be recorded as this will be important in deciding on best treatment (e.g., if there is surrounding eczema, then a topical steroid may be required or macerated skin may require additional protection) (see section 6 in the original guideline document).

A variety of methods exist to measure wounds, with most focusing on area rather than depth. As a general rule, sophisticated measuring devices are not required in

everyday practice. Serial tracings provide a reliable and cheap guide to ulcer progress. Ulcer size should always be recorded at the initial visit. Monthly recording is probably sufficient thereafter, unless there is a deterioration during treatment. It is important to remember that size alone does not give the entire picture, and comment should also be made about the ulcer depth, edges, and base and, if possible, whether there is significant exudate or not. These parameters will all aid in choosing the best dressing. In summary, the ulcer parameters required are:

- Ulcer site
- Ulcer size
- Ulcer depth
- Ulcer edge
- Ulcer base
- Exudate
- Surrounding skin

### General Assessment

Blood pressure, weight, and urinalysis should be recorded on all patients at first presentation. A general nutritional assessment is also useful. Several guides are available, and discussion with the local support dietician is invaluable and allows appropriate referral for nutrition advice. Baseline haematology and biochemistry are also useful.

### Ankle Brachial Pressure Index Measurements (ABPI)

Arterial pressure measurements are an essential component of ulcer assessment. They identify and quantify the presence and severity of arterial disease. They should be performed by personnel trained and experienced in the area (see original guideline document for steps to obtain accurate recordings).

Significance of ABPI measurements:

- $>0.92$  = Normal
- $0.5 - 0.92$  = Mild/moderate claudication
- $0.35 - 0.50$  = Severe claudication
- $<0.35$  = Critical ischaemia

Indices are normally  $>1.0$  in the absence of arterial disease. One of the most important points to remember is that, although  $0.80$  is taken as the cut-off for using high compression dressings, any value  $<0.92$  represents the presence of arterial disease. Therefore if patients find high compression intolerable, then one should consider that perhaps their arterial disease is more significant than the ABPI would indicate. Conversely, if a patient has an easily palpable pulse in the foot it is unlikely that they have any significant arterial disease. One must always question the accuracy of ABPI measurements if it is difficult to occlude the arteries, as deceptively high pressures will be recorded in the presence of calcification, e.g. in diabetics (Carter, 1973). If any doubt exists then patients should be referred to specialist units where more detailed non-invasive tests can be performed.

## Management of Venous Leg Ulcers

### Compression Therapy

- To reduce high pressure in the superficial veins
- To aid venous return of blood to the heart, by increasing the velocity of flow in the deep veins
- To reduce oedema by reducing the pressure difference between the capillaries and the tissues
- To transport metabolic products away from tissues and allow the ulcer to heal

The mainstay of conservative management of venous leg ulcers is focused on the reversal of venous hypertension, and the most effective way to manage uncomplicated venous leg ulcers is the correct application of graduated compression to the leg. This should only take place following clinical and Doppler assessment of each patient with leg ulcers (see section 3 in the original guideline document).

Compression bandaging is usually used to achieve healing of venous ulcers, while compression stockings are fitted for prevention of recurrence of ulceration, and for controlling oedema. Surgical referral may be appropriate via the general practitioner, for superficial vein surgery.

The first line management of venous leg ulcer patients following assessment with ABPI 0.8 to 1.2 is graduated high compression bandaging, including short stretch bandage regimes. Patients with an ABPI of <0.8 should be referred for vascular assessment.

Before applying compression check the ABPI and the ankle circumference.

Refer to the original guideline document for a discussion of the evidence regarding compression therapy and different types of compression bandaging.

### Multi-layer Compression Bandaging

All bandages are applied from the base of the toes to the tibial tuberosity with a 50% overlap. When using compression, accuracy of application is crucial to good management, and staff education is required.

### Short Stretch Bandages

Short stretch bandages are inelastic. Effective pressure is achieved through low resting pressure and high working pressure. Short stretch bandaging is a suitable treatment for ambulant patients who find multi-layer bandage system a problem at night.

### Patients Suitable for Reduced Compression

Following consultation with the vascular team, reduced compression can be considered for selected patients. Patients with ABPI of 0.6 to 0.7 can have



reduced compression using a padding layer, a crepe layer, and a light compression bandage applied in a figure of eight fashion. Patients with ABPI of 0.7 to 0.8 can be considered for padding layer, crepe bandage, and a moderate compression bandage (e.g., cohesive bandage).

#### Patients Not Suitable for Reduced Compression

Patients with ABPI of 0.5 or less, indicating severe arterial disease, should not receive any compression bandaging and should be referred to the vascular surgeon. Patients with diabetes may have false high ABPI readings, and compression should be used with caution. These patients should be referred to the vascular surgeon for assessment. Small vessel disease may be a problem (see section 1 in original guideline document).

Patients with arterial disease are not suitable for high compression therapy as it can exacerbate ischaemia by decreasing limb perfusion. Patients with venous ulcers usually have an ABPI equal to or greater than 0.8. All leg ulcer patients need to be assessed to provide appropriate treatment (see section 3 in original guideline document).

#### Management of Leg Ulcers

##### Environment for Healing

- Involve patient with their care and management plan.
- Where adequate diet may be lacking, ensure a high protein diet with zinc and vitamin C to promote healing. Where patients' clothing has become loose fitting, this can be a good indicator of recent weight loss, and referral may be required after nutritional assessment.
- Obese patients may require referral to nutritionist.
- In order for healing to take place, give encouragement to motivate the patient.
- Patients living alone or with elderly should be referred to day care services, where social isolation would also be addressed.
- Diabetic patients may need referral to the community nutritionist.
- Patients with ill fitting dentures should be referred for dental care.

##### Cleaning Leg Ulcers

Cleansing should take the form of irrigation rather than swabbing. It is gentler on healing tissue, causes less pain and will not interfere with the healing process. A clean technique is acceptable. (See "Good practice for cleansing leg ulcers" in section 4 of the original guideline document.)

##### Pain Management

Venous leg ulcers are frequently painful. Sustained compression may relieve pain. Elevation and rest will also reduce oedema. Monitor pain level with each assessment. New pain may indicate infection. Refer patient to a general practitioner (GP) for appropriate pain management.

## Dressing Leg Ulcers

The application of sustained, graduated compression is of far greater significance than the dressing selection. Venous leg ulcers are usually moist wounds, and a simple low adherent, low cost permeable dressing can be used with a hydrogel. Leg ulcers should not be allowed to dry out. Dressings remain in situ for one week. In heavily exuding wounds, more frequent dressing change is required.

To provide the optimum wound healing environment, the choice of dressing may need to change as the wound progresses through the stages of healing. The main aim is to select a dressing material that most suits the individual patient.

## Treatment of Chronic Wounds

- Removal of slough (debridement)
  - Excision of necrotic tissue is rarely necessary with leg ulcers.
  - Debridement may be enhanced by the use of an enzymatic wound debridement agent (e.g. Iruxol™ mono), hydrocolloid dressings, or hydrogels.
- Reduction of bacteria
- Cadexomer iodine (Iodoflex™) may be useful in removing slough and reducing the bacterial load and thus accelerate healing (Danielson, 1997).
  - Wound swabs are only necessary if clinical signs of infection are present when systemic antibiotics may be prescribed.
  - Topical antibiotics should never be prescribed.
- Reduction of exudate
  - With venous leg ulcers high compression bandaging will help to reduce exudate. Re-measurement of the ankle may be required to indicate that correct compression is being applied. The choices of dressing to absorb exudate include alginates, hydrocellular dressings, and hydrogels.

## Malodorous Wounds

Malodorous wounds can be very distressing for the patients and their families, leading to loss of appetite, social isolation, and depression. If clinical signs of infection are present, the infection should be treated with systemic antibiotics. A variety of dressings are useful in the management of the malodorous wound:

- Charcoal dressings
- Silver dressings
- Alginate and charcoal dressings
- Cadexomer iodine (Iodoflex™) where tolerated can eliminate odour and absorb exudate.

## Eczema/Dermatitis (see section 6 in the original guideline document)

- Patients present with an itchy erythema and a weeping scaling leg.
- Immerse the leg in warm drinkable tap water to assist de-scaling
- Apply an emollient.

- Avoid the use of tapes and adhesives. A light cotton tubigauze will support the dressings when surrounding skin is fragile.
- Graduated compression is the main treatment for venous eczema.
- Refer to general practitioner, who may prescribe a mild topical steroid to treat the inflammatory response.
- Referral to the dermatologist may be required via the general practitioner.

## Patient Education

In order to prevent ulcer recurrence, the patient's family and carers should be educated. Education leaflets should also be used.

### Patient lifestyle-education:

- Walk for 30 minutes at least twice a day, where possible.
- Practice leg and foot exercises when sitting.
- Elevate legs above waist level when sitting; never allow them to be dependent, where possible.
- Standing for long periods should be avoided.
- Minor lifetime changes can improve situations (e.g., use of a high stool when preparing food).

All patients with venous ulceration should be fitted with compression stockings (see "Table 3: Hosiery compression classes" in section 4 of the original guideline document).

### Guidelines to Prevent Ulcer Recurrence:

- Usually below knee compression stockings are used.
- Replace two pairs of compression stockings at least every six months at re-assessment.
- Ankle circumference is measured 2 cm above the malleolus.
- Stockings are put on before getting up in the morning.
- Skin care should continue nightly and good skin hygiene maintained.
- Patients should be encouraged to remain active. Elevation and rest should be emphasized.
- Re-assessment should be planned for all patients.

## Monitoring and Evaluation

Holistic accurate assessment and weekly re-assessment should be documented, using a leg ulcer assessment and progress chart. Wound tracing will give indication of the ulcer progress and re-assure patients and staff.

The patient and carers should be kept informed and involved in the decision-making process. Lifestyle changes (e.g., diet, exercise, elevation, skin care, social contact) should be part of the care plan. Outcomes should be evaluated.

## The Management of Infected Leg Ulcers and Guidelines for Referral to Hospital

Most ulcers are associated with venous hypertension and are managed successfully by a combination of compression therapy, elevation, nutritional support and exercises. When healed, recurrence should be minimized by appropriate compression hosiery/exercise regime. Unfortunately, some patients' ulcers fail to respond to conventional methodology and require further evaluation.

A chronic ulcer occurs when the preferred ordinary sequence of repair is disturbed at one or more stages during the healing process:

- Inflammation
- Proliferation
- Re-epithelialisation
- Remodeling

When the skin is breached, the major host defence mechanism is injured. In addition, serous exudate at body temperature is a prime culture medium and the gaiter area--site of most lower limb ulceration--is a site of sub-optimal wound healing.

The presence of wound-associated bacteria does not necessarily indicate infection--some bacteria may even facilitate healing, and wound inflammation may not necessarily be caused by infection. Additionally, wound bacteria may be transient and not detected on random culture swabs.

Distinguishing the difference between bacterial presence and pathological contamination is important; the presence of the cardinal signs of sepsis--fever, erythema, swelling, pain, and leucocytosis--are usually obvious, and a diagnosis of infected ulcer is readily made. More difficult, however, is the assessment of the combination of host pathology and bacterial factors and to what extent it may contribute to impair ulcer healing. The risk of significant wound infection is broadly determined by host resistance versus bacterial virulence: bacterial load.

The most common host factors associated with delayed wound healing of leg ulcers are outlined in "Table 2: Factors associated with difficulty in healing leg ulcers" in section 5 of the original guideline document.

Since the risk of significant infection is increased in ulcers of long duration, factors associated with delayed healing are also potentially associated with wound infection. A large spectrum of organisms may be isolated from leg ulcers; the most frequently isolated bacteria in leg ulcers are outlined in "Table 3: Distribution of bacteria in leg ulcers" in section 5 of the original guideline document.

## Assessment

When the ulcer proves resistant to conventional therapy, further assessment is desirable. Many factors associated with poor wound healing are also associated with infection, and it is necessary therefore to identify all potential relevant factors. It is important to elicit a history of systemic conditions that might cause pruritus (e.g., dermatological complaints, allergy, skin infestation). A history of poor patient compliance or tendency to interfere with bandages is valuable.

Patients with painful ulcers may not be compliant, especially if the dressing results in further pain. Previous lower limb trauma with silent deep vein thrombosis (DVT) may have resulted in post phlebitic limb; information regarding occupation (possibly involving long periods of standing), drug therapy, and systemic diseases should be sought.

A thorough physical examination is necessary, specifically seeking evidence of the disorders associated with difficulty in healing leg ulcers (see "Table 2: Factors associated with difficulty in healing leg ulcers" in section 5 of the original guideline document). Assessment of the ankle brachial index is required if any doubt exists about peripheral pulses; in the presence of infection, oedema may present difficulty in palpating peripheral pulses.

Wound assessment is vital. On removal of the dressing, malodour may indicate infection (e.g., pseudomonas). The presence of profuse exudate may indicate infection, as may purulent eschar. Surrounding erythema/cellulitis may indicate inflammation or infection. Oedema may result from infection but may also indicate lymphoedema, venous hypertension associated with varicose veins, or the presence of co-morbid conditions such as cardiac failure or intra-abdominal malignancy.

Routine blood investigation should include full blood count, erythrocyte sedimentation rate (ESR), urea and electrolytes, C reactive protein, liver function tests, lipid profile, and antibody screen. Duplex scan is required to rule out silent deep venous incompetence in particular but may also identify unsuspected long or short saphenous incompetence. Plain X-rays are frequently unhelpful in suspected osteomyelitis, and it is necessary to obtain an isotope bone scan to confirm suspected underlying bone involvement.

Bacteriological assessment: If possible, the laboratory technician should extract and process samples as quickly as possible in order to maximise efficiency and minimise erroneous bacteriology. The most effective sampling of bacterial flora is by obtaining a sample of exudate from the wound (Lawrence, 1993). If the patient is hospitalised, screening for Methicillin-resistant *Staphylococcus aureus* (MRSA) is prudent. In overt sepsis, culture swabs should be obtained prior to administering systemic antibiotics. Delayed healing may be due to sub-clinical bacterial infection, and, when suspected, quantitative cultures may be useful especially when considering transient use of topical antimicrobial agents.

### Treatment/Dressings

General symptomatic treatment is directed at removal of debris (escharectomy), controlling exudate (thus reducing local skin damage), maintaining a moist environment (to promote epithelialisation), pain relief to optimise mobility, and compression therapy (removal of venous hypertension).

The most common sources of infection include self contamination, contact (clothing, dressings, hands), and airborne (dust, droplets); this knowledge must be utilised to disrupt bacterial contamination.

### Wound Cleansing:

Reduction of exudate and eschar is achieved initially with normal saline or water. This can be performed with a moist gauze swab, gently pouring the solution over the ulcer, irrigation with a syringe or proprietary spray cleanser. Chemical or surgical debridement may be required in addition.

Antiseptic agents have antibacterial properties but also have cytotoxic properties that may inhibit healing by interfering with healthy granulation tissues. The agents of choice (Iodine or Chlorhexidine) are used when blood supply is impaired and in patients with impaired immunity. Their use is primarily to reduce bacterial load.

#### Antibiotics:

The use of antimicrobial agents in the management of lower limb ulceration is controversial: unfortunately there is a tendency to over-treat, thus resulting in the unfortunate side effect of encouraging the growth of and subsequent colonisation by antibiotic resistant organisms.

#### Topical antimicrobials:

The aim of topical agents is to reduce bioburden, and the choice is determined by the offending organisms. While clinical judgement may detect organisms (i.e. pseudomonas), laboratory culture reports are usually used to select a topical agent. If available, quantitative culture may be utilised to indicate decrease in the bioburden (number of bacteria) as a response to treatment. Skin sensitivity may occur--neomycin, perfumes, and lanolin may be present in topical antimicrobial preparations. These should be avoided where possible as they are common allergens (Cameron, 1997). Topical agents can only treat the wound surface and will not effectively treat underlying deep infection. Their use should be re-assessed after 2 weeks or if deeper infection is suspected.

#### Systemic antibiotics:

Systemic antibiotics should be used:

- a. When there are signs of systemic sepsis
- b. When infection extends beyond the ulcer margin
- c. If the ulcer base extends deeply to underlying bone.
- d. If the patient is obviously septic, standard hospital protocol will probably dictate the administration of broad spectrum antibiotics.

In an ulcer of short duration, gram positive cover is usually adequate pending the availability of culture/sensitivity reports. In patients with immunosuppression, broad spectrum agents including gram negative and anaerobes should be included.

#### When to Refer to Hospital

The majority of leg ulcers are managed very well in the community by nurses. However, some leg ulcers should be referred to hospital clinics for further assessment or a review of treatment. Arterial or malignant ulcers may need

surgery, as will those venous ulcers that arise secondary to varicose veins. Diabetic ulcers need careful management, while those with severe skin problems will require dermatological advice.

#### Criteria for Referral of the Patient to Hospital

- Suspected malignancy
- Arterial/mixed ulcers
- Diabetes mellitus and ulcer
- Sepsis--cellulitis, fever, leucocytosis
- Absent pulses with impaired ABPI
- Failure to heal with standard regime
- Underlying co-morbidity
- Deterioration
- Recurrent ulceration
- Need for surgery--varicose veins surgery, skin graft, biopsy, revascularization
- Pain management

#### Dermatology and Skin Care of the Lower Limb

The skin of the lower legs is particularly prone to some specific inflammatory skin reactions. These may occur de novo or appear secondarily to skin injury or disease. Chronic venous stasis, oedema with distension of the skin, and ulceration are particular problems of the lower limb, which lead to distinctive cutaneous changes.

Eczema is a common feature in the clinical presentation of chronic leg ulcers. The term eczema encompasses a broad range of skin conditions and is used interchangeably with dermatitis

Eczema/Dermatitis presents as:

- Itching (pruritis)
- Inflammation of the skin (redness, pain, swelling)
- Weeping (exudation) and scaling (exfoliation)

Eczema/Dermatitis may be:

- Endogenous and related to constitutional factors such as atopy or venous insufficiency
- Exogenous and precipitated by irritating substances in contact with the skin (irritating contact dermatitis), or development of allergy (allergic contact dermatitis).

Sometimes elements of both endogenous and exogenous factors combine to produce eczematous change.

#### Asteatotic Dermatitis

This is a severe form of dry skin of the lower legs where fissuring or cracking of the surface takes place due to the loss of oily secretions. The low humidity of

central heating during winter, swimming, over-washing and the use of diuretics are contributing factors. This poorly recognised condition is particularly common in elderly patients. It is pruritic and presents as very dry skin with a network of erythematous superficial fissures which resembles 'crazy paving.'

The management of asteatotic dermatitis requires:

- the use of a topical steroid ointment to reduce inflammation and itch
- a liberal application of bland emollients to counteract dryness
- avoidance of vigorous washing

As with all applications of ointments and creams to the skin of the lower legs, it is important to apply these in a downward direction, consistent with the angle of growth of the hair follicles. Failure to do this can result in an occlusive folliculitis with the development of multiple minute itchy pustules on the leg. The topical steroid should be applied twice daily to the inflamed skin. This is then covered with an emollient such as 50% white soft paraffin and 50% liquid paraffin. When the eczema has cleared, the continued use of emollients and soap substitutes prevents recurrence of the dryness. It should be emphasised to the patient that this maintenance treatment needs to be continued indefinitely (Watts, 1998).

Stasis Dermatitis/Stasis Eczema:

Venous insufficiency compromises the cutaneous surface of the lower limbs by reducing the efficiency of the microcirculation in the skin and by distention due to oedema of the lower limbs.

Stasis dermatitis or varicose eczema:

- tends to affect older patients
- usually involves the gaiter area, particularly the medial aspect of the lower leg, around the medial malleolar region
- if secondarily infected, can become more generalised
- stasis dermatitis may be acute or chronic

Management of stasis eczema:

- Acute: It is important that the underlying venous hypertension is controlled by adequate support stockings or compression bandages. The acute stage of stasis eczema is managed by using a dilute solution of potassium permanganate, which has an antibacterial effect as well as assisting in drying exudation. The affected leg should be immersed in the solution for no longer than 10 to 15 minutes at each dressing change. This should then be followed by the application of a moderate strength corticosteroid ointment such as betamethasone 0.1% RD ointment daily for one week approximately. This should be gradually replaced by a simple emollient, which does not contain known sensitisers. Creams instead of ointments are often more acceptable to the patient as they are less greasy. However, it is important to inform patients that creams contain preservatives and emulsifiers, and these allergens may cause sensitivity problems in patients with a leg ulcer. A simple emollient, such as a mixture of 50% white soft paraffin and 50% liquid



paraffin, should be used regularly to keep the skin lubricated. If treatment with the topical corticosteroid is stopped suddenly, there may be a rebound effect and the eczema may recur, so gradual reduction is important (Cameron, 1999, Cameron, 1998).

- Chronic: In the chronic phase when the skin is dry and scaly the affected leg should be lubricated with an emollient such as 50% white soft paraffin and 50% liquid paraffin to keep the skin hydrated. Systemic antibiotics should be given over a period of a week to 10 days only if significant infection is present. Topical antibacterial corticosteroid preparations are indicated if infected eczema is present. The skin surrounding the ulcer should be protected from wound exudate by using an absorbent dressing and the application of a topical barrier preparation such as zinc paste.

## Atopic Eczema

Atopic eczema is a chronic, dry, itchy, and irritating skin condition. The cause of atopic eczema is unknown. It affects the flexural surfaces with involvement of the popliteal fossae and the antecubital fossae, but it can become generalised. Young children and some adults are affected particularly on the ankle region. The persistent and severe pruritus (itch) leads to constant scratching (excoriation), with damage to the cutaneous barrier function and susceptibility to secondary bacterial infection (impetiginisation).

## Management of Atopic Eczema

General management measures are directed towards reducing pruritus and correcting dry skin. Avoidance of a warm atmosphere (which increases skin heat and dryness), woolen clothing (which irritates the sensitive skin), strenuous exercise, or prolonged sunlight exposure (which increases body heat and perspiration) are important. Atopic patients are prone to viral infections, especially widespread herpes simplex, warts, and molluscum contagiosum, and the clinician must be clinically vigilant to recognise these developments. Treatment is aimed at regular lubrication of the skin, the intermittent use of mild topical steroids, and antihistamines. Systemic antibiotics are often required for flares of eczema as the inflamed skin becomes infected. It is important to recognise infection in the eczematous skin. If the increased inflammation is mistakenly thought to represent more active eczema, a stronger topical steroid might be prescribed resulting in deterioration of the patient's condition.

## Contact Dermatitis

- Irritant contact dermatitis: Acute irritant dermatitis usually occurs after a short single exposure to a potent irritant, for example, strong acid or alkali. Wound exudate has a very irritant effect on skin surrounding an ulcer and can create an irritant contact dermatitis. Preparations used in the treatment of varicose eczema, such as antiseptics, adhesives, and bandages applied directly to the skin, may be contributing factors in the production of this type of skin reaction.
- Allergic contact dermatitis: This occurs following exposure to and sensitisation by an agent capable of initiating an allergic reaction (allergen). Further exposure to the agent in a sensitised person results in an eczematous reaction. The occlusive nature of many leg ulcer applications on broken or

eczematous skin can create the perfect environment for sensitisation to develop. Patients may become allergic to any component part of their topical therapy, including the dressings, emollients, creams, bandages, or bath additives. Sensitisation requires exposure to the allergen, and about 10 to 14 days later the reaction becomes visible in the skin. The individual may not realise sensitisation has occurred until re exposure to the agent results in a severe reaction. Continued exposure to an allergen results in a progressively deteriorating clinical picture. To investigate patients suspected of having allergic contact dermatitis, referral to a dermatologist for patch testing is important. Identification of the causative allergen is essential for successful management, which involves its strict avoidance. Patients should be made aware that more than one product may have the allergen as a constituent (Gooptu & Powell, 1999, Powell, 1996).

### General Approach to Skin Care

It is important to avoid the use of known irritants and allergens in the management of venous leg ulcers. Therefore the following risk factors should be considered:

- The use of ointments instead of creams is advisable, thus reducing the risk of sensitization. Avoid using antiseptics and topical antibiotics.
- Protect skin from elasticated bandages.
- Do not use woollen bandages on dry skin.
- Use appropriate dressings to absorb wound exudates.
- Protect surrounding skin with the application of an appropriate barrier.
- Products containing lanolin or fragrances should be avoided.
- Ideally vinyl gloves should be used instead of latex especially where rubber allergy is suspected. (Cameron, 1998, Cameron & Powell, 1996, Gooptu & Powell, 1999)

### Recognition of Infection

The early recognition of the signs and symptoms of infection is important in the management of varicose eczema such as;

- Pain
- Erythema
- Increase in the level of exudate
- Malodour

Reserve a swab for culture and sensitivity, and treat with an appropriate oral antibiotic.

### Patient Education

- Identification of allergens (sensitisers) by patch testing and the avoidance of allergens and irritants play an important part in the patient's management (see "Table 1: Common Allergens found in Venous Ulcer Therapies" in section 6 of the original guideline document).

- The patient should be provided with a list of known sensitisers and advised not to use perfumated or "over the counter products" which may lead to sensitisation.
- Emollients are the first line of treatment and should be used regularly to hydrate the skin. A simple emollient which is unlikely to sensitise the patient, such as 50% white soft paraffin/50% liquid paraffin, should be used.
- Apply emollients in a downward motion in the direction of the hair growth, and continue on a long term basis.

### Management of the Hard to Heal Leg Ulcer

#### Assessment

The use of a scoring system (e.g., "The Rule of Six") may help to identify patients who are difficult or slow to heal. The rule states that venous ulcers larger than six centimeters squared present for six months or more when treated with graduated compression are unlikely to heal within six months.

#### Wound Bed Management

A healthy wound bed is vital for healing. This may be achieved by regular and frequent debridement and the use of agents such as topical collagenase and also by decreasing the local bacterial burden by the judicious use of slow release iodine products. There is no doubt that some non-healing chronic venous ulcers are 'stuck' in one of the phases of normal healing. Proper wound bed management can sometimes move the healing process onwards towards the next phase.

#### Sub-fascial Endoscopic Perforator Vein Surgery (SEPS)

This procedure should be reserved for patients with difficult to heal leg ulcers or patients with a previously healed leg ulcer (e.g., clinical severity, etiology, anatomy, pathophysiology [CEAP] classification V and V1). All patients undergoing this surgical procedure should have pre-operative assessment of the lower limb anatomy by colour-coded Doppler ultrasonography. The incompetent perforators can then be marked on the skin of the leg in the operating room.

When clinically indicated conventional superficial venous surgery is always done in association with sub-fascial endoscopic perforator vein surgery.

#### Bio-engineered Skin Substitutes

There are bio-engineered skin substitutes commercially available that may accelerate healing. Although theoretically this may seem an attractive treatment option, early results only show modest increases in healing rates in conjunction with standard compression therapy.

#### Mixed Arterial Venous Ulcers

Invasive angiography may be required to reveal significant arterial disease in patients with a slow to heal chronic leg ulcer and a significant arterial component. Endovascular or bypass surgical techniques may be required to achieve healing.

## CLINICAL ALGORITHM(S)

None provided

## EVIDENCE SUPPORTING THE RECOMMENDATIONS

### REFERENCES SUPPORTING THE RECOMMENDATIONS

[References open in a new window](#)

### TYPE OF EVIDENCE SUPPORTING THE RECOMMENDATIONS

The type of supporting evidence is not specifically stated for each recommendation.

## BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS

### POTENTIAL BENEFITS

#### Overall Benefits

- Leg ulcer assessment is a prerequisite to effective leg ulcer management, minimises the improper use of treatments, reduces the risk of long term ulceration, and facilitates the early detection of potential limb threatening aetiologies.
- Appropriate management of leg ulcers in Ireland can help promote healing and prevent recurrence.

#### Specific Benefits

##### Compression

- Several studies have shown that compression improves healing rates compared to treatments using no compression or standard treatment.
- There is reliable evidence from two randomized controlled trials that high compression achieves better healing rates than low compression.
- The superiority of multi-layer high compression systems over single layer systems has been shown by one large and two small trials, which found more ulcers had healed at 24 weeks using 4-layer bandaging than were healed using a single layer adhesive compression bandage.

### POTENTIAL HARMS

- Antiseptic agents have cytotoxic properties, which may inhibit healing by interfering with healthy granulation tissues.
- The use of antimicrobial agents in the management of lower limb ulceration is controversial: unfortunately there is a tendency to over-treat, thus resulting in the unfortunate side effect of encouraging the growth of and subsequent colonization by antibiotic resistant organisms.

## CONTRAINDICATIONS

### CONTRAINDICATIONS

Topical antibiotics should never be prescribed for the treatment of chronic wounds.

## IMPLEMENTATION OF THE GUIDELINE

### DESCRIPTION OF IMPLEMENTATION STRATEGY

An implementation strategy was not provided.

## INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT CATEGORIES

### IOM CARE NEED

Getting Better  
Living with Illness  
Staying Healthy

### IOM DOMAIN

Effectiveness  
Patient-centeredness

## IDENTIFYING INFORMATION AND AVAILABILITY

### BIBLIOGRAPHIC SOURCE(S)

Smith & Nephew Ltd. Grace P, editor(s). Guidelines for the management of leg ulcers in Ireland. Dublin (Ireland): Smith & Nephew Ltd; 2002. 44 p.

### ADAPTATION

Not applicable: The guideline was not adapted from another source.

### DATE RELEASED

2002

### GUIDELINE DEVELOPER(S)

Smith and Nephew, Ltd. - Private For Profit Organization

### SOURCE(S) OF FUNDING

Smith and Nephew, Ltd.

#### GUIDELINE COMMITTEE

Not stated

#### COMPOSITION OF GROUP THAT AUTHORED THE GUIDELINE

##### Primary Authors

Pathophysiology of leg ulcers: Pierce Grace, MCh, FRCS, FRCSI, Consultant Vascular Surgeon, Mid Western Regional Hospital, Limerick

Prevalence and aetiology of leg ulcers in Ireland: Fionnuala O'Brien, MSc Project Coordinator for Cardiovascular Health Strategy, MWHB; Paul Burke, MCh, FRCS, FRCSI, Consultant Vascular Surgeon, St John's and the Mid Western Regional Hospitals, Limerick

Assessment of patients with leg ulcers: Mary Paula Colgan, MD, RVT, FACA, Physician in Vascular Medicine, St. James's Hospital, James's St. Dublin 8

Management of venous leg ulcers: Pauline Diamond, RPHN, FFN, RCSI, Primary care development unit NWHB Markievicz House, Sligo

The management of infected leg ulcers and guidelines for referral to hospital: Dermot Hehir, MB, MCh, FRCSI, Consultant Surgeon. General Hospital, Arden Road, Tullamore, Co Offaly

Dermatology and skin care of the lower limb: Dorothy O Sullivan, RGN, SCM, RPHN, Clinical Nurse Manager, Dermatology Services, Regional Centre of Dermatology, Mater Misericordiae Hospital, Eccles St, Dublin; Frank Powell FRCP, FRCP (Edin) Consultant Dermatologist, Mater Misericordiae Hospital, Dublin

Management of the hard to heal leg ulcer: William P. Joyce, MB, MCh, FRCSI, FRSC, (Ed) Consultant in General and Vascular Surgery, Cavan General Hospital, Lisdarn, Co Cavan

#### FINANCIAL DISCLOSURES/CONFLICTS OF INTEREST

Not stated

#### GUIDELINE STATUS

This is the current release of the guideline.

#### GUIDELINE AVAILABILITY

Print copies and CD-ROM: Available from Smith & Nephew Limited, Carraig Court, George's Avenue, Blackrock, Co. Dublin, Ireland; Phone: +353-1-217-0444, Fax:

+353-1-217-0455; Web site: [www.smith-nephew.com/ie](http://www.smith-nephew.com/ie); E-mail: [sandra.o'shaughnessy@smith-nephew.com](mailto:sandra.o'shaughnessy@smith-nephew.com).

#### AVAILABILITY OF COMPANION DOCUMENTS

None available

#### PATIENT RESOURCES

The following is available:

- Coping with a leg ulcer. Frequently asked questions. Dublin (Ireland): Smith & Nephew Limited; 2003 Dec. 2 p.

Print copies: Available from Smith & Nephew Limited, Carraig Court, George's Avenue, Blackrock, Co. Dublin, Ireland; Phone: +353-1-217-0444, Fax: +353-1-217-0455; Web site: [www.smith-nephew.com/ie](http://www.smith-nephew.com/ie); E-mail: [sandra.o'shaughnessy@smith-nephew.com](mailto:sandra.o'shaughnessy@smith-nephew.com).

Please note: This patient information is intended to provide health professionals with information to share with their patients to help them better understand their health and their diagnosed disorders. By providing access to this patient information, it is not the intention of NGC to provide specific medical advice for particular patients. Rather we urge patients and their representatives to review this material and then to consult with a licensed health professional for evaluation of treatment options suitable for them as well as for diagnosis and answers to their personal medical questions. This patient information has been derived and prepared from a guideline for health care professionals included on NGC by the authors or publishers of that original guideline. The patient information is not reviewed by NGC to establish whether or not it accurately reflects the original guideline's content.

#### NGC STATUS

This NGC summary was completed by ECRI on February 2, 2004. The information was verified by the guideline developer on February 16, 2004.

#### COPYRIGHT STATEMENT

This NGC summary is based on the original guideline, which is subject to the guideline developer's copyright restrictions.

© 1998-2004 National Guideline Clearinghouse

Date Modified: 11/8/2004



